AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

1. (currently amended): A feed-dispersion system for fluid catalytic cracking units (FCC) for introducing a liquid hydrocarbon feed atomized by an atomization fluid in a reactor for fluid catalytic cracking, wherein said system comprises:

a feed injection system made up of two concentric conduits, an inner conduit and an outer conduit of substantially circular section, wherein the atomization fluid is introduced through a first flange and flows through the inner conduit while the liquid hydrocarbon feed is introduced through a second flange and flows through the annular space formed by the outer surface of the inner conduit and the inner surface of the outer conduit; and

an atomizing unit comprising nozzles arranged in rows, with a central row formed by the sequence of nozzles connected on one end to the inner conduit of atomization fluid and connected to a mixing chamber on the other end, and by at least one side row formed by the sequence of side nozzles connected on one end to the outer feed conduit and connected to the mixing chamber on the other end, where in this unit:

the central nozzle(s) and side nozzle(s) of the said atomizing unit are geometrically placed so as to transfer, by contact, the energy of the atomization fluid to the flow of liquid feed; ~~and~~

~~a~~ the mixing chamber is formed by the combination of ~~the~~ discharge zones of the central nozzle(s) of atomization fluid; and

the feed and atomization fluid are admixed in the mixing chamber and form a homogeneous spray having a fan-like shape which exits the outlet of the mixing chamber in an unobstructed way and in a direction substantially parallel to the symmetry axes of the central nozzles.

2. (original): A feed-dispersion system according to claim 1, wherein the liquid hydrocarbon feed is a light gasoil, a heavy gasoil or an atmospheric residue, alone or admixed.

3. (previously presented): A feed-dispersion system according to claim 1, wherein the atomization fluid is an inert gas used between 1 and 5% by weight based on the weight of the feed.

4. (original): A feed-dispersion system according to claim 3, wherein the inert gas is nitrogen.

5. (original): A feed-dispersion system according to claim 3, wherein the inert gas is fuel gas.

6. (original): A feed-dispersion system according to claim 3, wherein the inert gas is steam.

7. (original): A feed-dispersion system according to claim 1, wherein for each central nozzle of atomization fluid there is at least one feed side nozzle.

8. (original): A feed-dispersion system according to claim 5, wherein for each central nozzle of atomization fluid there are at least two feed side nozzles.

9. (previously presented): A feed-dispersion system according to claim 1, wherein the number of atomization fluid nozzles varies between 1 to 12.

10. (original): A feed-dispersion system according to claim 1, wherein the symmetry axes of the central nozzles are parallel to the symmetry axes of the inner/outer conduits.

11. (original): A feed-dispersion system according to claim 1, wherein the symmetry axes of the central nozzles are non-parallel to the symmetry axes of the inner/outer conduits.

12. (original): A feed-dispersion system according to claim 1, wherein the symmetry axes of the side nozzles are non-parallel to the symmetry axes of the inner/outer conduits.

13. (original): A feed-dispersion system according to claim 1, wherein the mixing chamber is the geometric locus formed by the sequence of free surfaces downstream of each contact point of the atomization fluid with the feed.

14. (previously presented): A feed-dispersion system according to claim 13, wherein in the mixing chamber the dimensional relationship L1/L2 between respectively length and width of the bottom of said chamber is comprised in the range of from 0.5 to 20.

15. (original): A feed-dispersion system according to claim 13, wherein the mixing chamber comprises an opening angle α, measured in the direction of the sequence of nozzles of atomization fluid.

16. (currently amended): A feed-dispersion system according to claim 15, wherein the opening angle α varies between 5° and 90°~~, α being a function of the number of atomization fluid nozzles~~.

17. (original): A feed-dispersion system according to claim 13, wherein the mixing chamber comprises an opening angle β measured perpendicularly to the sequence of atomization fluid nozzle (110).

18. (previously presented): A feed-dispersion system according to claim 17, wherein the opening angle β of chamber (101) varies between zero and 20°.

19. (original): A feed-dispersion system according to claim 1, wherein the central nozzle for atomization fluid is cylindrical.

20. (original): A feed-dispersion system according to claim 1, wherein the central nozzle for atomization fluid is convergent.

21. (original): A feed-dispersion system according to claim 1, wherein the central nozzle for atomization fluid is convergent/divergent.

22. (previously presented): A feed-dispersion system according to claim 21, wherein the edges of the converging section of the atomization fluid nozzle comprise sloping angles between 30 and 120°, while the diverging section comprises angles from zero to 90°.

23. (original): A feed-dispersion system according to claim 1, wherein the side nozzle for liquid feed is cylindrical.

24. (original): A feed-dispersion system according to claim 1, wherein the side nozzle for liquid feed is convergent.

25. (previously presented): A feed-dispersion system according to claim 1, wherein the convergent side nozzle comprises an inlet, an inner bevel and a discharge orifice.

26. (previously presented): A feed-dispersion system according to claim 1, wherein 2, 4, 6 or more of said systems are radially coupled to the riser of a fluid catalytic cracking equipment, at one, two or more riser levels, at an elevation angle between 30 and 70°.

27. (withdrawn): A method of atomizing a hydrocarbon feed comprising the steps of

a) supplying hydrocarbon feed to a side nozzle system;

b) supplying atomization fluid to a central nozzle system;

c) accelerating the flows of hydrocarbon feed in a substantially radial direction into a mixing chamber using said side nozzle system; and

d) mixing said accelerated flows of hydrocarbon feed so as to transfer energy from said atomization fluid to said hydrocarbon feed and thereby atomize said hydrocarbon feed.

28. (previously presented): A feed-dispersion system according to claim 9, wherein the number of atomization fluid nozzles varies between 4 to 9.

29. (previously presented): A feed-dispersion system according to claim 9, wherein the number of atomization fluid nozzles varies between 3 to 7.

30. (previously presented): A feed-dispersion system according to claim 14, wherein in the mixing chamber the dimensional relationship L1/L2 between respectively length and width of the bottom of said chamber is comprised in the range of from 1 to 10.

31. (previously presented): A feed-dispersion system according to claim 30, wherein in the mixing chamber the dimensional relationship L1/L2 between respectively length and width of the bottom of said chamber is comprised in the range of from 2 to 7.

32. (previously presented): A feed-dispersion system according to claim 16, wherein the opening angle α varies between 10° and 60°.

33. (previously presented): A feed-dispersion system according to claim 18, wherein the opening angle β of chamber (101) varies between 1° and 12°.

34. (previously presented): A feed-dispersion system according to claim 22, wherein the edges of the converging section of the atomization fluid nozzle comprise sloping angles between 40° and 90°.

35. (previously presented): A feed-dispersion system according to claim 22, wherein the edges of the converging section of the atomization fluid nozzle comprise sloping angles between 50° and 80°.

36. (previously presented): A feed-dispersion system according to claim 22, wherein the edges of the diverging section comprise angles from 5° to 30°.

37. (previously presented): A feed-dispersion system according to claim 22, wherein the edges of the diverging section comprise angles from 6° to 14°.

38. (previously presented): A feed-dispersion system according to claim 3, wherein the atomization fluid is an inert gas used between 2 and 4% by weight based on the weight of the feed.

39. (new): A feed-dispersion system according to claim 1, wherein for each central nozzle of atomization fluid there are two feed side nozzles.

40. (new): A feed-dispersion system according to claim 1, where the central nozzles are laterally juxtaposed.